

IN THE CLAIMS

Please amend claims 1, 2, and 10, and cancel claim 3, as follows. Please also amend withdrawn claims 8, 9, 11-15, and 18-22 as follows.

1. (Currently Amended) A damascene method for use in forming a magnetic head, comprising:

forming a hard mask layer over an insulator layer;

forming a photoresist layer over the hard mask layer;

performing an image patterning process with the photoresist layer to produce a pattern in the photoresist layer for producing a patterned photoresist having a write coil pattern;

etching to remove portions of the hard mask layer in accordance with the ~~pattern~~ patterned photoresist for producing a patterned hard mask having the write coil pattern;

etching to remove portions of the insulator layer in accordance with the ~~pattern~~ patterned hard mask for producing a patterned insulator having the write coil pattern, and to remove the patterned photoresist;

etching to remove ~~remaining portions of the etched~~ patterned hard mask layer;

after removing the patterned hard mask, electroplating an electrically conductive material within the etched portion of the patterned insulator layer having the write coil pattern, for producing a plurality of write coil layers of a write coil of the magnetic head;
and

performing a planarization process over the ~~resulting structure~~ electrically conductive material.

2. (Currently Amended) The damascene method of claim 1, wherein the planarization process is improved by the act of etching to remove the ~~remaining portions of the etched~~ patterned hard mask layer.

3. (Canceled)

4. (Original) The damascene method of claim 1, wherein the electrically conductive material comprises copper (Cu).

5. (Original) The damascene method of claim 1, wherein the hard mask layer comprises SiO₂.

6. (Original) The damascene method of claim 1, wherein the hard mask layer comprises Ta₂O₅.

7. (Original) The damascene method of claim 1, wherein the planarization process comprises a chemical-mechanical polishing (CMP).

8. (Withdrawn-Currently Amended) The damascene method of claim 1, wherein the acts of etching to remove portions of the hard mask layer and the insulator layer ~~in accordance with the pattern~~ comprise plasma etching.

9. (Withdrawn-Currently Amended) The damascene method of claim 1, wherein the acts of etching to remove portions of the hard mask layer and the insulator layer ~~in accordance with the pattern~~ comprises a reactive ion etch (RIE).

10. (Currently Amended) The damascene method of claim 1, wherein the act of etching to remove ~~remaining portions of the~~ patterned hard mask layer comprises a reactive ion etch (RIE).

11. (Withdrawn-Currently Amended) The damascene method of claim 1, wherein the act of etching to remove ~~remaining portions of the~~ patterned hard mask layer comprises a reactive ion etch (RIE) with use of a fluorine gas.

12. (Withdrawn-Currently Amended) The damascene method of claim 1, wherein the act of etching to remove ~~remaining portions of the~~ patterned hard mask layer comprises a low-bias and isotropic reactive ion etch (RIE).

13. (Withdrawn-Currently Amended) The damascene method of claim 1, further comprising:

wherein the act of etching to remove portions of the hard mask layer in accordance with the ~~pattern~~ patterned photoresist comprises a reactive ion etch (RIE) with use of a fluorine gas; and

wherein the act of etching to remove ~~remaining portions of the~~ patterned hard mask ~~layer~~ comprises a reactive ion etch (RIE) with use of a fluorine gas.

14. (Withdrawn-Currently Amended) A method of forming a write coil of a magnetic head, comprising:

forming a hard mask layer over an insulator layer, the insulator layer comprising a hard-baked resist;

forming a photoresist layer over the hard mask layer;

performing an image patterning process ~~to produce a write coil pattern in~~ with the photoresist layer for producing a patterned photoresist having a write coil pattern;

etching, with use of the patterned photoresist, to remove portions of the hard mask layer in accordance with the write coil pattern for producing a patterned hard mask having the write coil pattern;

etching, with use of the patterned hard mask, to remove portions of the hard-baked resist in accordance with the write coil pattern for producing a patterned hard-baked resist having the write coil pattern;

~~etching to remove portions of the insulator layer in accordance with the write coil pattern;~~

etching to remove ~~remaining portions of the etched~~ patterned hard mask layer;

after removing the patterned hard mask, electroplating an electrically conductive material comprising copper (Cu) within ~~the etched portion of the~~ patterned hard-baked resist for forming a plurality of write coil layers of the write coil; and performing a chemical-mechanical polishing (CMP) process over the electrically conductive material.

15. (Withdrawn-Currently Amended) The method of claim 14, wherein the CMP process is improved by the act of etching to remove the ~~remaining portions of the etched~~ patterned hard mask layer.

16. (Withdrawn) The method of claim 14, wherein the hard mask layer comprises SiO₂.

17. (Withdrawn) The method of claim 14, wherein the hard mask layer comprises Ta₂O₅.

18. (Withdrawn-Currently Amended) The method of claim 14, wherein the acts of etching to remove portions of the hard mask layer and the hard-baked resist ~~in accordance with the write coil pattern~~ comprise a reactive ion etch (RIE).

19. (Withdrawn-Currently Amended) The method of claim 14, wherein the act of etching to remove ~~remaining portions of the~~ patterned hard mask layer comprises a reactive ion etch (RIE).

20. (Withdrawn-Currently Amended) The method of claim 14, wherein the acts of etching to remove ~~remaining portions of the~~ patterned hard mask layer comprises a reactive ion etch (RIE) with use of a fluorine gas.

21. (Withdrawn-Currently Amended) The method of claim 14, wherein the act of etching to remove ~~remaining portions of the~~ patterned hard mask ~~layer~~ comprises a low-bias and isotropic reactive ion etch (RIE).

22. (Withdrawn-Currently Amended) The method of claim 14, further comprising:

wherein the act of etching to remove portions of the hard mask layer ~~in accordance with the write coil pattern~~ comprises a reactive ion etch (RIE) with use of a fluorine gas; and

wherein the act of etching to remove ~~remaining portions of the etched~~ patterned hard mask ~~layer~~ comprises a RIE with use of a fluorine gas.